Space Weather Forecast

Issued on Saturday 2 November 2024 at 13:19 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity with Moderate flares expected, and a chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was moderate with four Moderate flares, the largest of which from AR3878 in the northeast. There are fourteen active regions, with two as yet unnumbered regions. A large region in the NE remains the most active flare source with a complex magnetic structure. A cluster of spots in the southwest, contain a couple of spots that have continued to show some complexity in their structure, as well as some recent flare activity. Most other sunspots only showing slow evolution currently.

No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have generally been at slightly elevated levels, briefly reaching elevated levels following a recent transient CME arrival. The Interplanetary Magnetic Field (IMF), Bt, was weak to moderate, peaking later in the period following transient arrival. The north-south component, Bz, was mostly weak and positive (northward directed), but became more persistently negative (southward) later in the period. Geomagnetic activity was Quiet to Active (Kp0-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was just below S1 Minor Radiation Storm levels, continuing to slowly ease through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate or High activity is expected to continue with occasional Moderate flares expected and a chance of further isolated Strong flares. Into days 3-4 (04-05 Nov) flare risk perhaps reducing somewhat as sunspot regions in the west begin to rotate off the visible disk.

Solar Wind / Geomagnetic Activity: A CME which left the sun during the 31st Nov has the potential to give a glancing blow to Earth late on day 2 (03 Nov) or into early day 3 (04 Nov). Quiet to Unsettled geomagnetic activity is expected initially, with a chance of isolated Active intervals due to current enhancements. Activity expected to increase to become more generally Unsettled into day 2 (03 Nov) and day 3 (04 Nov), with a chance of Active and a slight chance of G1/Geomagnetic Storm intervals given the risk of a glancing CME blow and faster solar wind

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influence. Activity currently expected to be generally Quiet to Unsettled once again by day 4 (05 Nov).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is now below the S1 Moderate Radiation Storm level, and continuing to slowly decline. However, any further notable flares bring a persistent chance for further enhancement during the period.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	70	70
Very Active	R3-R5 (X Class)	No	25	25	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	30	25	25
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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